

WHAT IS CLAIMED IS:

1. A process for making a metal tool having controlled porosity, comprising the steps of:
 - preparing metal powder by gas atomization;
 - filling a metal container with the metal powder;
 - placing the powder-filled container in a metal vessel;
 - surrounding the powder-filled container in the metal vessel with glass frit;
 - heating the metal vessel to a temperature sufficient to melt the glass frit; andthen
 - compacting the metal vessel under sufficient pressure to partially consolidate the metal powder so as to retain a desired amount of porosity therein.
2. A process as set forth in Claim 1 wherein the step of preparing the metal powder comprises preparing a tool steel powder.
3. A process as set forth in Claim 1 wherein the step of heating the metal vessel comprises the step of heating the metal vessel at a temperature of about 1850°F to about 2050°F.
4. A process as set forth in Claim 1 wherein the step of compacting the metal vessel comprises the step of pressing the metal vessel at a pressure of about 250 tons to about 600 tons.
5. A process as set forth in Claim 1 wherein prior to the step of filling the metal container, the process comprises the step of screening the metal powder to provide a powder particle size that is appropriate for the type of product for which the metal tool will be used.

6. A process for making a composite metal tool having controlled porosity, comprising the steps of:

- preparing metal powder by gas atomization;
- placing a piece of a fully consolidated metal in a metal container;
- filling the metal container with the metal powder;
- placing the powder-filled container in a metal vessel;
- surrounding the powder-filled container in the metal vessel with glass frit;
- heating the metal vessel to a temperature sufficient to melt the glass frit; and

then

compacting the metal vessel under sufficient pressure to bond the metal powder to the fully consolidated metal piece and to partially consolidate the metal powder so as to retain a desired amount of porosity therein.

7. A process as set forth in Claim 6 wherein the step of preparing the metal powder comprises preparing a tool steel powder.

8. A process as set forth in Claim 6 wherein the step of heating the metal vessel comprises the step of heating the metal vessel at a temperature of about 1850°F to about 2050°F.

9. A process as set forth in Claim 6 wherein the step of compacting the metal vessel comprises the step of pressing the metal vessel at a pressure of about 250 tons to about 600 tons.

10. A process as set forth in Claim 6 wherein prior to the step of filling the metal container, the process comprises the step of screening the metal powder to provide a powder particle size that is appropriate for the type of product for which the metal tool will be used.